

CLAIMS

1. A method of stamping an article from a metal alloy sheet material where the shape of said article cannot be stamped into said sheet in a single stamping operation without exceeding the straining limit of the sheet at a location in the geometry of said article, said sheet material being strain hardenable and having known stress/strain forming properties and being initially in a softened condition for forming by stamping, said method comprising:

predetermining, from said forming properties and the thickness of said sheet, a preform shape that is a deformation precursor of said article shape, and an annealing practice for said preform shape, said preform shape and said annealing practice enabling the one step stamping of the geometry of said article from said preform shape without exceeding the straining limit of the sheet; and thereafter

stamping a blank of said sheet material into said preform shape;
annealing at least a selected portion of said preform by said
annealing practice; and

stamping said annealed preform to the shape of said article, the duration of said annealing step being no greater than twice the duration of either of said stamping steps.

2. A method of stamping an article as recited in claim 1 where said stamping of said preform shape, the annealing of said annealed preform and the stamping of said annealed preform to the shape of said article are performed in a continuous sequence of operations of substantially equal duration.

3. The method of stamping an article as recited in claim 1 in which the period of heating for the annealing of said preform shape is no more than fifteen seconds.

4. The method of stamping an article as recited in claim 1 in which the period of heating for the annealing of said preform shape and a period for cooling of the annealed preform, if cooling is required, enables the preform stamping/preform annealing/final shape stamping sequence of steps to be performed as a continuous process sequence.

5. The method of stamping an article as recited in claim 1 in which said annealing step restores the temper of the preform stamping to the temper quality of the sheet metal material prior to said preform stamping step.

6. The method of stamping an article as recited in claim 2 in which said annealing step restores the temper of the preform stamping to the temper quality of the sheet metal material prior to said preform stamping step.

7. The method of stamping an article as recited in claim 3 in which said annealing step restores the temper of the preform stamping to the temper quality of the sheet metal material prior to said preform stamping step.

8. The method of stamping an article as recited in claim 4 in which said annealing step restores the temper of the preform stamping to the temper quality of the sheet metal material prior to said preform stamping step.

9. The method of stamping an article as recited in claim 1 in which said sheet metal material is a magnesium containing, aluminum alloy of the AA5xxx family.

10. The method of stamping an article as recited in claim 2 in which said sheet metal material is a magnesium containing, aluminum alloy of the AA5xxx family.

11. The method of stamping an article as recited in claim 3 in which said sheet metal material is a magnesium containing, aluminum alloy of the AA5xxx family.

12. The method of stamping an article as recited in claim 4 in which said sheet metal material is a magnesium containing, aluminum alloy of the AA5xxx family.

13. A method of stamping an article from an metal alloy sheet material where the shape of said article cannot be stamped into said sheet in a single stamping operation without exceeding the straining limit of the sheet at a location in the geometry of said article, said sheet material being strain hardenable and having known stress/strain forming properties and being initially in a softened condition for forming by stamping, said method comprising:

predetermining, from said forming properties and the thickness of said sheet, a preform shape that is a deformation precursor of said article shape, and an annealing practice for said preform shape, said preform shape and said annealing practice enabling the one step stamping of the geometry of said article from said preform shape without exceeding the straining limit of the sheet; and thereafter

stamping a blank of said sheet material into said preform shape;

annealing at least a selected portion of said preform by said annealing practice;
cooling said annealed preform, if necessary;
lubricating said preform, if necessary; and
stamping said annealed preform to the shape of said article, the duration of each of said stamping steps and of said annealing, cooling and lubricating steps are managed so that said article is formed by said steps in a continuous process sequence.

14. The method of stamping an article as recited in claim 13 in which said sheet metal material is a magnesium containing, aluminum alloy of the AA5xxx family.